Although the invention has been described in detail in the foregoing for the purpose of illustration, it is to be understood that such detail is solely for that purpose and that variations can be made therein by those skilled in the art without departing from the spirit and scope of the invention except as it may be limited by the claims.

Nano-sized diene-based polymer latex particles

Amended Claims filed with the request for preliminary examination

Claims

1. Diene-based unsaturated polymer latex particles having a particle size measured as d_{90}-value of less than 30nm.

2. Latex particles according to claim 1, wherein the diene-based latex particles are acrylonitrile/butadiene polymers.

3. Method for producing diene-based unsaturated polymers in latex form comprising

   a) polymerization of at least one diene D and optionally at least one copolymerisable monomer A

   b) in water,

   c) in the presence of a surfactant, preferably an alkyl sulphate, wherein

   d) diene D and optionally at least one copolymerisable monomer A are continuously charged into a reactor containing the aqueous medium, a polymerisation initiator and the surfactant, preferably in slow and steady feeding rate,

   wherein an amount of less than 1% by weight, based on the amount of water, of unreacted diene D and optionally monomer A in the water phase in the reactor is maintained.

4. Method according to claim 3, wherein the diene D is 1,3-butadiene and wherein at least one copolymerizable monomer A is reacted.

5. Method according to at least one of the preceding claims wherein the copolymerizable monomer A is acrylonitrile.

6. Method according to at least one the preceding claims wherein the polymerization is performed in the presence of a surfactant in an amount of 0.1% to 1% in weight based on the total monomer amount used.

7. Method according to at least one of the preceding claims, wherein the obtained diene-based latex particles have a diameter measured as d_{90}-value of less than 60nm.

8. Method according to at least one of the preceding claims, wherein the polymerization initiator is a redox initiator, preferably a persulfate.

9. Method according to at least one of the preceding claims, wherein the surfactant is an alkylsulfate.

10. Method for hydrogenation of unsaturated diene-based polymers, wherein diene-based latex particles according to at least one of the preceding claims are hydrogenated.

11. Use of polymers according to at least one of the preceding claims as rubber or rubber intermediate.

Claims

1. Diene-based unsaturated polymer latex particles having a particle size measured as d_{90}-value of less than 30nm.

2. Latex particles according to claim 1, wherein the diene-based latex particles are acrylonitrile/butadiene polymers.

3. Method for producing diene-based unsaturated polymers in latex form comprising

   a) polymerization of at least one diene D and optionally at least one copolymerisable monomer A

   b) in water,

   c) in the presence of a surfactant, preferably an alkyl sulphate, wherein

   d) diene D and optionally at least one copolymerisable monomer A are continuously charged into a reactor containing the aqueous medium, a polymerisation initiator and the surfactant, preferably in slow and steady feeding rate,

   wherein an amount of less than 1% by weight, based on the amount of water, of unreacted diene D and optionally monomer A in the water phase in the reactor is maintained.

4. Method according to claim 3, wherein the diene D is 1,3-butadiene and wherein at least one copolymerizable monomer A is reacted.

5. Method according to claim 3 or 4, wherein the copolymerizable monomer A is acrylonitrile.

6. Method according to any one of claims 3 to 5, wherein the polymerization is performed in the presence of a surfactant in an amount of 0.1% to 1% in weight based on the total monomer amount used.

7. Method according to any one of claims 3 to 6, wherein the obtained diene-based latex particles have a diameter measured as d_{90}-value of less than 60nm.

8. Method according to any one of claims 3 to 7, wherein the polymerization initiator is a redox initiator, preferably a persulfate.

9. Method according to any one of claims 3 to 8, wherein the surfactant is an alkylsulfate.

10. Method for hydrogenation of unsaturated diene-based polymers, wherein diene-based latex particles according to claim 1 or 2 are hydrogenated.

11. Use of polymers according to claim 1 or 2 as rubber or rubber intermediate.